Chapter Three
Facility Requirements

INTRODUCTION

One of the primary objectives of this planning study is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize the airport. Data from Chapter 1 and forecasts from Chapter 2 are coupled with established planning criteria to determine what improvements are necessary to airside and landside areas. Then, having established the facility requirements, alternatives for providing these facilities are provided in Chapter 4 to determine the viability of meeting the facility needs.

The time frame for addressing development need usually involves short-term (up to five years), medium-term (six to ten years), and long-term (eleven to twenty year) periods. Long range planning primarily focuses on the ultimate role of the airport and is related to development. Medium-term planning focuses on a more detailed assessment of needs, while the short-term analysis focuses on immediate action items and may include details not geared towards long-term development.

AIRPORT REFERENCE CODE

The Airport Reference Code (ARC) is a system established by the FAA that is used to relate airport design criteria to the operational and physical characteristics of the aircraft currently operating and/or intended to operate at the airport. The ARC has two components relating to the airport design aircraft. The first component, depicted by a letter, is the Aircraft Approach Category and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the Aircraft Design Group and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runway dimensional criteria and safety zones prior to and beyond the end of the runway. Aircraft wingspan is primarily associated with separation criteria involving taxiways and taxilanes. Table 3-1 has been included to provide a definition of both Aircraft Approach Categories and Aircraft Design Groups. Figure 3-1 shows examples of aircraft and their Airport Reference Codes.

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific ARC for the airport must be determined. In order to designate a specific ARC for an airport, aircraft in that ARC should perform a minimum of 500 annual itinerant operations. The aircraft currently using the

TABLE 3-1
AIRCRAFT APPROACH CATEGORIES AND DESIGN GROUPS

AIRCRAFT APPROACH CATEGORY: An aircraft approach category is a grouping of aircraft based on an approach speed of 1.3 times the stall speed of the aircraft at the maximum certificated landing weight.

Aircraft Category	Approach Speed
Category A	Speed less than 91 knots
Category B	91 knots or more but less than 121 knots
Category C	121 knots or more but less than 141 knots
Category D	141 knots or more but less than 166 knots
Category E	166 knots or more

AIRCRAFT DESIGN GROUP: The aircraft design group subdivides aircraft by wingspan. The aircraft design group concept links an airport's dimensional standards to aircraft approach categories or to aircraft design groups or to runway instrumentation configurations. The aircraft design groups are:

Design Group	Aircraft Wingspan
Group I	Up to but not including 49 feet
Group II	49 feet up to but not including 79 feet
Group III	79 feet up to but not including 118 feet
Group IV	118 feet up to but not including 171 feet
Group V	171 feet up to but not including 214 feet
Group VI	214 feet up to but not including 262 feet

AI

Primarily Single-Engine Propeller Aircraft, some light twins

Example Type: Cessna 172 Skyhawk

BI

Primarily Light Twin-Engine Propeller Aircraft

Example Type: Piper Navajo

BII

(<12,500 lbs)
Primarily Light Turboprops

Example Type: Beechcraft King Air

BII

(>12,500 lbs)
Mid-sized corporate jets and commuter airliners

Example Type: Cessna Citation II

A/BIII

Primarily large commuter-type aircraft

Example Type: De Havilland Dash 8

CI, DI

Primarily small and fast corporate jets

Example Type: Lear Jet 36

C/DII

Large corporate jets and regional-type commuter jets

Example Type: Gulfstream IV

C/DIII

Commercial airliners (approx. 100-200 seats)

Example Type: Boeing 737

C/DIV

Large commercial airliners (approx. 200-350 seats)

Example Type: Boeing 767

DV

Jumbo commercial airliners (approx. 350+ seats)

Example Type: Boeing 747

FIGURE 3-1. AIRPORT REFERENCE CODES

Taylor Municipal Airport have an ARC of A-I, B-I and B-II. Airport users and fleet mix were discussed in Chapter 2. Examples of aircraft with an ARC of A-I and B-I are listed in Table 3-2. Examples of aircraft with an ARC of A-II and B-II are listed in Table 3-3. These are the types of aircraft expected to utilize the airport in the short, medium and long-term time frames. A small number of operations by C-I and C-II aircraft occur at Taylor given the available runway length and the existing GPS approach.

This information indicates that fundamental development items in the short-term should be based on an ARC of B-II for aircraft weighing up to 45,000 pounds. Although forecasted demand levels do not indicate a need for upgrading the ARC to C-II or greater within the 20-year planning period, where feasible, future facilities should be developed to meet C-II design standards as to minimize any constraints for upgrading the ARC should it become necessary.

TABLE 3-2 EXAMPLE AIRCRAFT HAVING AN ARC OF A-I OR B-I

Aircraft	Approach Speed (knots)	Wingspan (feet)	Max T.O. Weight (pounds)
Beech Baron 58P	101	37.8	6,200
Beech Bonanza V35B	70	33.5	3,400
Beech King Air B100	111	45.9	11,799
Cessna 150	55	33.3	1,670
Cessna 172	60	36.0	2,200
Cessna 177	64	35.5	2,500
Cessna 182	64	36.0	2,950
Cessna 340	92	38.1	5,990
Cessna 414	94	44.1	6,750
Cessna Citation I	108	47.1	11,850
Gates Learjet 28/29	120	42.2	15,000
Mitsubishi MU-2	119	39.1	10,800
Piper Archer II	86	35.0	2,500
Piper Cheyenne	110	47.6	12,050
Rockwell Sabre 40	120	44.4	18,650
Swearingen Merlin	105	46.3	12,500
Raytheon Beechjet	105	43.5	16,100

Source: FAA AC 150/5300-13, Airport Design

TABLE 3-3 EXAMPLE AIRCRAFT HAVING AN ARC OF A-II OR B-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Max T.O. Weight (pounds)
Air Tractor 802F	105	58.0	16,000
Beech King C90-1	100	50.3	9,650
Beech Super King Air B200	103	54.5	12,500
Cessna 441	100	49.3	9,925
Cessna Citation II	108	51.6	13,300
Cessna Citation III	114	50.6	17,000
Dassault Falcon 50	113	61.9	37,480
Dassault Falcon 200	114	53.5	30,650
Dassault Falcon 900	100	63.4	45,500
DHC-6 Twin Otter	75	65.0	12,500
Grumman Gulfstream I	113	78.5	35,100
Pilatus PC-12	85	52.3	9,920

Source: FAA AC 150/5300-13, Airport Design

AIRSIDE FACILITY REQUIREMENTS

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area and any visual or electronic approach aids.

RUNWAY REQUIREMENTS

Annual Service Volume: The Annual Service Volume (ASV) is a calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in one year. When compared to the forecasts or existing operations of an airport, the ASV will give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*.

The FAA Airport Design Program was used to calculate the ASV for a single runway airport with the forecasted operation levels determined in Chapter 2. Annual Service Volume for a single runway configuration is 230,000 operations per year. Under these conditions, a single runway facility will adequately meet the capacity demand within the time frame of this study.

Demand/Capacity: The methodology for computing the relationship between an airport's demand versus its capacity is contained in FAA AC 150/5060-5.

To facilitate this comparison, computations were made to determine the hourly capacity of a single runway configuration in VFR and in IFR. The calculations were made using the assumptions recommended in the Advisory Circular for the particular airport layout and conditions, combined with the forecast operational data generated with this study. The following is a tabulation of the physical aspects of the four aircraft classes (not to be confused with the aircraft approach categories discussed earlier), as considered in the capacity computations.

The majority of existing operations at the Taylor Municipal Airport are conducted by Class A and B aircraft. For ultimate conditions, approximately 10% of operations by Class C aircraft are estimated. No airspace limitations exist which would affect runway use. In all calculations, it is assumed that arrivals equal departures, and that "touch-and-go" activity accounts for no more than 25% of total operations.

TABLE 3-4 FAA AIRCRAFT CLASSIFICATIONS FOR CAPACITY CONSIDERATIONS

Class	Maximum Takeoff Weight	Engines
A	12,500 lbs. or less	Single Engine
B	12,500 lbs. or less	Multi Engine
C	12,500 to 300,000 lbs.	Multi Engine
D	Over 300,000 lbs.	Multi Engine

Runway Capacity: Using the above conditions and applying them to the Hourly Capacity charts in the Advisory Circular, the average peak capacities for a single runway configuration were determined as shown in Table 3-5. The Design Hour operations in 2025 represent approximately 4% of the estimated hourly capacity of the runway under VFR conditions and 6% of the estimated hourly capacity of the runway under IFR conditions.

TABLE 3-5 HOURLY CAPACITY, OPERATIONS PER HOUR (2025)

	VFR	IFR
Single Runway	98	59

Runway Length: The FAA has developed a computer software program entitled "Airport Design." The program provides the user with recommended runway lengths and other facilities on an airport according to FAA design standards. The information required to execute the program for recommended runway lengths, includes airfield elevation, mean maximum temperature of the hottest month and the effective gradient for the runway. This specific information for the Taylor Municipal Airport was used for the purposes of this portion of the study:

Field Elevation: 5,820' MSL
Mean Maximum Temperature of Hottest Month: 90.0^{o} F
Effective Gradient: 105 Feet

(Note: The actual difference in feet from runway end to runway end is required to run the FAA software program and is listed as the effective gradient. However, the effective gradient is usually shown as a percent.)

With this data, the Airport Design program provides several runway length recommendations for both small and large aircraft according to varying percentages of aircraft fleet and associated takeoff weights. A summary of the data provided by the program is listed in Table 3-6.

TABLE 3-6 RECOMMENDED RUNWAY LENGTH

Description	Runway Length
Existing Runway Length	7,203'
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.)	
Less than 10 passenger seats	
75 percent of these small airplanes	5,100'
95 percent of these small airplanes	7,220'
100 percent of these small airplanes	7,220'
10 or more passenger seats	7,220'
Large Aircraft (>12,500 lbs., <60,000 lbs.)	
75 percent of these planes at 60 percent useful load	8,100'
75 percent of these planes at 90 percent useful load	9,650'
100 percent of these planes at 60 percent useful load	12,050'
100 percent of these planes at 90 percent useful load	12,050'

Source: FAA Computer Software Program, Airport Design Version 4.2d

Using only the results of the FAA's software program, it would be fair to suggest that the runway should have a minimum length of 7,220 feet. This would accommodate 100 percent of the small aircraft fleet. However, it is important to identify the runway length requirements for the specific aircraft that are expected to operate at the airport.

Takeoff Distance Requirements: When determining runway length requirements for any airport it is necessary to consider the types of aircraft (aircraft design group and critical aircraft) that will be using the airport and their respective takeoff distance requirements. Figure 3-2 gives examples of takeoff distance requirements for the aircraft currently using the Taylor Municipal Airport and aircraft that could potentially use the airport in the future.

Based on the required runway lengths for these categories of aircraft, the existing runway length of 7,203 feet provides adequate takeoff distance for forecasted operations throughout the planning period. This length accommodates the single-engine piston aircraft fleet, most of the twin-engine piston, light turboprop and B-II turbojet aircraft fleet.

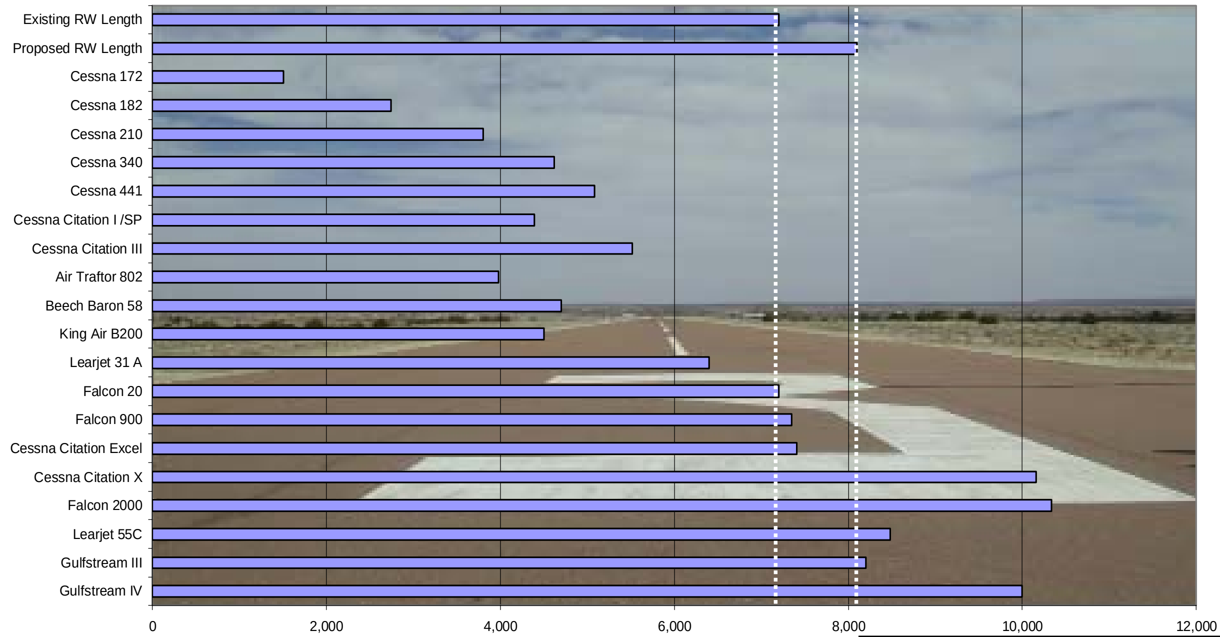


FIGURE 3-2. RUNWAY LENGTH CHART

**Aircraft performance data based on a mean maximum temperature of the hottest month of 91.9° F and an airport elevation of 5,428 feet mean sea level (MSL).*

Large aircraft requiring in excess of 7,203 feet of runway length are primarily C-II aircraft. Where feasible, obstruction clearances, land uses and property ownership should be established to accommodate a potential runway extension to 8,100 feet in the event the airport is upgraded to ARC C-II.

<u>Runway Strength and Width</u>: Runway strength requirements are normally based upon the design aircraft that may be expected to use the airport on a regular basis. The existing runway strength of 12,500 pounds Single Wheel Gear (SWG) is adequate to accommodate the aircraft currently using the airport.

FAA design standards for runways serving aircraft having an ARC of B-II require a minimum runway width of 75 feet. Runways serving aircraft with an ARC of C-II require a minimum width of 100 feet. A strengthening overlay to increase the pavement strength to 30,000 pounds should be accomplished if more than 500 operations occur by aircraft weighing more than 12,500 pounds. A runway widening to 100 feet in conjunction with a runway strengthening should be accomplished if operations by aircraft in approach category C exceed 500 annually.

CROSSWIND RUNWAY REQUIREMENTS

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate ARC, then a crosswind runway should be considered.

The wind study analysis described in Chapter 1 indicated that Runway 3/21 at the Taylor Municipal Airport meets the FAA standard of at least 95 percent crosswind coverage according to the 2003 AWOS wind data. Local pilots also report the wind as prevailing from the south-southwest. Wind data from the AWOS should be connected to the National Weather Service for recording purposes. During the next Master Plan Update, ten years worth of data should then be analyzed.

RUNWAY INCURSIONS

There are currently no runway incursion mitigations measures in pace at the Taylor Municipal Airport; nor are ay recommended dues to the single runway configuration.

TAXIWAY REQUIREMENTS

Length and Width: The primary function of a taxiway system is to provide access between runways and the terminal area. The taxiways should be located so that aircraft exiting the runway will have minimal interference with aircraft entering the runway or remaining in the traffic pattern. Taxiways expedite aircraft departures from the runway and increase operational safety and efficiency. The construction of a parallel taxiway system is considered essential at airports having at least 20,000 annual operations or those served by commercial service.

According to FAA Advisory Circular 150/5300-13, Airport Design, the minimum recommended runway to taxiway centerline separation for an airport with an ARC of B-II is 240 feet and the minimum recommended width is 35 feet. The minimum recommended runway to taxiway separation for an airport with an ARC of C-II or B-II with an instrument approach with visibility minimums lower than ¾-mile is 300 feet. Approximately 4,800 feet of the existing parallel taxiway at the Taylor Municipal Airport was constructed in 2004. This portion of taxiway was constructed at a runway separation of 300 feet to allow for a future upgrade of the airport reference code to C-II or a future instrument approach with visibility minimums of lower than ¾-mile. The remaining 2,400 feet of the parallel taxiway at the Taylor Municipal Airport is located at a runway separation of 240 feet. The entire taxiway is 35 feet wide. When aircraft operations by approach Category C aircraft exceed 500 annually, or the instrument approach minimums are lowered to less than ¾ miles, the 2,400 feet of parallel taxiway at 240-foot separation should be relocated to 300 feet.

Strength: The strength of the taxiway should be maintained at a strength equal to that of the primary runway pavement.

AIRCRAFT APRON

The apron space requirements as shown in this planning document were developed according to recommendations given in AC 150/5300-13, *Airport Design*. Consideration must be made in the overall apron requirements for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways and proximity to all aircraft expected to use the airport, including turboprops and business jets.

All existing based aircraft are currently hangared and all future based aircraft owners have indicated the desire to hangar the aircraft. Consequently, future apron square yardage should be planned for transient aircraft only. The existing aircraft parking apron provides a sufficient number of tiedowns; however, reconfiguring the apron will enable the fueling island (which currently obstructs the taxiway) to be relocated, will provide adequate parking for larger aircraft, and will provide building sites for up to four new hangars.

Tiedown Requirements: Aircraft tiedowns should be provided for those small and medium sized aircraft utilizing the airport. These aircraft risk being damaged or may cause damage or injury in sudden wind gusts if not properly secured. Approximately 20 tiedowns are required to accommodate the forecasted peak daily transient aircraft and overnight transient aircraft, plus based aircraft that are not hangared. The current tiedown layout is based on Group I taxilane OFAs. The future apron layout should be expanded to provide for Group II taxilane OFAs.

Apron Requirements:
Generally speaking, an apron tiedown area should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, circulation and fuel truck movement. The Town of Taylor should plan for additional apron expansion and taxilane expansion to T-hangars. Demand for T-hangar space has been indicated and the Town should take advantage of this revenue generating opportunity. The current PCI index for the apron is listed as 87 or fair condition. Again, this PCI value anticipated a crack and slurry seal application that was not applied, so the actual PCI value is less than 87. It is estimated that in order to accommodate a reconfigured apron with Group II taxilanes, an additional 5,000 square yards of apron will be required.

NAVIGATIONAL AIDS

A Navigational Aid (NAVAID) is any ground based visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Nondirectional Beacons (NDBs), and Tactical Air Navigational Aids (TACANs), as examples. There are no ground based NAVAIDs at the Taylor Municipal Airport and none are recommended.

APPROACH PROCEDURES

Non-precision Global Positioning System (GPS) approaches do not require ground-based facilities on or near the airport for navigation. The GPS receiver uses satellites for navigation allowing remote installation. Therefore, it involves little or no cost for the Airport Sponsor. GPS was developed by the United States Department of Defense for military use and is now available for civilian use. GPS approaches are rapidly being commissioned at airports across the United States. Approach minimums as low as 350-foot ceilings and 1-mile visibility are typical for this type of approach. An instrument approach will increase the utility of the airport by providing for the capability to operate in inclement weather conditions. This is especially important for air medivac/air ambulance, physician transport and business flights. It is also useful for conducting training and maintaining instrument currency and proficiency requirements.

The existing approach procedure at the airport includes a non-precision instrument GPS approach to Runway 21. The approach minimums for this approach are 361-foot ceiling and 1-mile visibility. A future potential approach that should be considered is a GPS approach procedure with vertical guidance (LNAV/VNAV) using the Wide Area Augmentation System (WAAS). This approach could potentially provide instrument minimums as low as 300-foot ceilings and ¾-mile visibility. The LNAV/VNAV approach would increase the FAR Part 77 Primary Surface from 500 feet wide to 1,000 feet wide. The hangars located at 400 feet from the runway centerline would be a penetration of the primary surface; however, the Obstacle Free Zone (OFZ) would remain clear and pending the results of an airspace analysis, the hangars could be obstruction lighted without affecting the approach.

The key to this type of approach would be a runway obstacle free zone (OFZ) and runway object free area (OFA) clear of obstructions. The width of the OFA would increase to 800-feet (400-feet on each side of the runway) with the upgrade of the airport reference code to C-II or the lowering of the instrument approach minimums to less than ¾-mile visibility. In order to protect for the future precision approach, all future buildings at the Taylor Municipal Airport should be setback at least 400 feet from the runway centerline. This approach would also require the relocation of the existing FBO hangar and terminal building as they are currently not setback 400 feet. Additionally, the FAR Part 77 primary surface and transitional surface penetrations (described later in this Chapter) should be obstruction lighted.

AIRFIELD LIGHTING, SIGNAGE, MARKING AND VISUAL AIDS

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Lighting and visual aids can consist of a variety of equipment or a combination thereof as described in Chapter 1. The airport's existing inventory of lighting and visual aids includes two-box precision approach path indicators, a rotating beacon, medium intensity runway lights (MIRLs), lighted signs, runway end identifier lights (REILs), 6-light runway threshold lights, visual runway markings, a segmented circle, and taxiway reflectors. The airport terminal area is also protected with area security lighting. The majority of the airfield lighting and visual aids are in good condition and should be maintained in their present condition. The immediate lighting upgrades needed are replacement of the MIRLs and installation of two-way bicolored white/amber globes at the last 2,000-feet of Runway 21 and the replacement of the 6-light runway threshold light system with a 8-light system. An approach lighting system (ALS) such as ODALS, MALS, MALSF, SSALS, SALS would be necessary to obtain ¾-mile visibility minimums. The ALS is designed to provide earlier visual acquisition of the runway approach in visibility limiting Instrument Meteorological Conditions (IMC).

Runway 3/21 is currently marked as a visual runway at both ends. Because there is a published instrument approach procedure to Runway 21, this runway should be remarked with non-precision instrument runway markings.

LANDSIDE FACILITY REQUIREMENTS

Landside facilities are another important aspect of the airport. Landside facilities serve as the processing interface between the surrounding community and the airport operating environment. Likewise, it offers the traveler the first impression of the airport and the local area. Landside facilities house the support infrastructure for airside operations and often generate substantial revenues for the airport.

TERMINAL BUILDING

The existing terminal building is shown in Figure 3-3. The construction of a terminal building at any airport offers many amenities to passengers, local and transient pilots and airport management. Terminal buildings (often called pilot lounges at general aviation airports) most often house public restrooms, public telephones, a pilot's lounge and information regarding airport services. The existing terminal building at the Taylor Municipal Airport is attached to the FBO maintenance hangar. The terminal building includes a lobby area, restrooms, telephone, a flight planning room and airport management offices. The terminal building is well maintained and provides adequate space and amenities to accommodate existing and long term demand.

FIGURE 3-3. EXISTING TERMINAL AND HANGAR

HANGAR FACILITIES

Hangars are typically classified as either T-hangars, small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit, or conventional hangars, small to very large units, which accommodate a variety of aircraft types or corporate fleets. The number of aircraft that each conventional hangar can hold varies according to the manufacturer and the specifications of the airport owner or operators. The existing hangars at the Taylor Municipal Airport include the 70-foot by 70-foot FBO maintenance hangar and 5 T-hangars located off the end of Runway 21. The T-hangars are shown in Figure 3-4.

FIGURE 3-4. EXISTING T-HANGARS

Based Aircraft Hangar Requirements: Future facility requirements for based aircraft typically determine the number of tiedown locations, number of shaded spaces, number of T-hangars and number of conventional type hangars required. The forecast of based aircraft in Chapter 2 estimates 10 aircraft based at the airport once hangar facilities or land to build hangars is included in a terminal area plan and made available to lease. Planning for future hangars should include a mix of T-hangars, box hangars and some larger corporate hangars.

Transient Aircraft Hangar Requirements: Transient single-engine aircraft operators generally do not require aircraft storage facilities unless there is inclement weather expected (such as hail or snow) or if the operator is planning an extended stay. Some higher performance single-engine and multi-engine aircraft operators may desire overnight aircraft storage or a heated hangar in the winter.

General: The airport sponsor should consider providing long-term land leases to interested parties for the construction of aircraft storage hangars. Allowing the tenant to retain ownership of the hangar while leasing the ground reduces capital outlay requirements for the Town of Taylor, enables the Town to collect property taxes on the hangar and other improvements and provides motivation for the tenant to maintain the hangar in good condition to maximize resale value at the end of the lease period. However, recent legislation has made aircraft hangars an eligible cost under the Airport Improvement Program (AIP). While this creates an opportunity for airport sponsors willing to build hangars to meet existing demand, hangars are still typically considered a lower priority than airside projects. The Town of Taylor should still consider applying for federal grants to construct needed hangars. The Town should also charge a standard annual, monthly and overnight tiedown fee for use of the open apron.

Aviation Fuel Facilities

Fuel is available Monday-Saturday during business hours at the Taylor Municipal Airport. The Town of Taylor offers 100-Low Lead avgas to based and transient aircraft owners. Based upon a review of historical monthly fuel sales, the existing avgas fuel facility is sufficient to handle normal avgas demand. The existing fuel facility at the Taylor Municipal Airport will need to be relocated as the existing location results in aircraft penetration of the taxiway object free area (TOFA) during refueling. The system is also outdated and repair parts are no longer available. It is also recommended that a self-serve credit card reader fueling system be installed to provide 24-hour fuel access at the airport. If the Town of Taylor desires to attract more business jet traffic, consideration should also be given to adding a Jet-A fuel tank or fuel truck. Recent legislation has also made airport fuel facilities eligible for federal funding under AIP. However, as with hangars, fuel facility projects are also considered a low priority. The Town of Taylor should still apply for federal grants to relocate and replace the existing fuel facility.

Airport Access and Vehicle Parking

The Taylor Municipal Airport is accessed by traveling west on Willow Lane off of Main Street (Highway 77) and then turning left or south on Airport Road. The current location of Airport Road penetrates the Runway 21 object free area (ROFA). It is recommended that Airport Road be relocated to correct this design standard deficiency. It is recommended that the airport provide adequate automobile parking to accommodate pilots, employees, visitors and passengers. Peak hour demand estimates were developed in Chapter 2 and were used to determine vehicle-parking requirements. The peak hour estimates would require a minimum of 8 vehicle-parking spaces for pilots, employees, visitors and passengers in the short term and 10 vehicle-parking spaces in the medium to long term. Existing vehicle parking should be reconfigured in conjunction with the apron reconfiguration.

Fencing and Security

The Taylor Municipal Airport is currently encompassed by a five-strand barbed-wire fence and the terminal area is surrounded by a four-foot chain link fence. The primary purpose of this fencing is to restrict inadvertent access to the airport by wildlife and persons. There are currently three gate areas available to access the airport. The gate area at the end of Runway 21 should be closed as it is a runway object free area (OFA) penetration and access to the hangars at the Runway 21 end should be provided through one of the two gates located near the terminal area. This gate access should be considered in the terminal area plan.

Airport Rescue and Fire Fighting (ARFF) Equipment & Storage Building

Airport Rescue and Fire Fighting (ARFF) equipment is not required at airports that do not serve scheduled passenger service with aircraft having 10 or more passenger seats. Local municipal or volunteer fire departments typically provide fire protection to general aviation airports in their district. Mutual aid agreements may also be provided for nearby fire departments to assist in emergency situations. In any case, procedures should be in place to ensure emergency response in case of an accident or emergency at the airport. Although statistically very safe, the most likely emergency situations at general aviation airports are an aircraft accident, fuel or aircraft fire or hazardous material (fuel) spill. The level of protection recommended in FAA Advisory Circular 150/5210-6D, *Aircraft Fire and Rescue Facilities and Extinguisher Agents*, for small general aviation airports is 190 gallons of aqueous film forming foam (AFFF) supplemented with 300 pounds of dry chemical. Proximity suits should be utilized for fire fighter protection. Aviation rated fire extinguishers should be immediately available in the vicinity of the aircraft apron and fueling facilities. Adequate facilities should be provided to store any ARFF vehicle(s) or equipment that is acquired. Currently, aviation fire extinguishers are available at the

Taylor Municipal Airport and the Taylor Fire Department responds to emergencies at the airport. The Taylor Fire Department currently meets approximately 50 percent of these recommendations. It is recommended that the Taylor Fire Department try to meet the recommendations in FAA Advisory Circular 150/5210-6D. However, these are only recommendations as ARFF equipment is technically not required at the Taylor Municipal Airport.

SNOW REMOVAL EQUIPMENT

The Town of Taylor currently provides snow removal services at the airport and these services are considered adequate to meet the existing and future demand at the airport.

INFRASTRUCTURE NEEDS

UTILITIES

Available utilities at the airport have been designed and sized to meet the typical needs of a general aviation airport. Water, electrical power, phone, gas and sewer are positioned to be extended to future terminal area expansion on the east side of the airport. The existing electrical power is a 3-phase line and the water service is via a 6-inch line. A utility corridor running parallel to the hangar area access road is recommended. A load analysis should be conducted to determine appropriate line capacities and flow rates for these utilities.

WEATHER REPORTING

It is recommended that the Automated Weather Observation System (AWOS) be connected to National Airspace Data Interchange Network (NADIN). NADIN consists of the National Weather Service, Air Traffic Control, the Weather Channel, Flight Service Station, FAA, DUATS and other commercial vendors. This will increase the safety and utility of the airport by making automated weather observations more readily accessable to local and transient pilots and will also allow a digital record of these observations for future wind rose development. The AWOS should be relocated to a location on the northwest side of the runway to accommodate future hangar development and meet the AWOS critical area clearance requirements.

LAND USE COMPATIBILITY AND CONTROL

AIRPORT PROPERTY

The existing airport property line encompasses 180 acres according to the airport legal description. According to the Navajo County Assessor's office, the airport is contained within Parcel Number 205-04-019, owned in fee by the Town of Taylor. The Runway Protection Zone (RPZ) for Runway 3 is encompassed within the airport property line. The RPZ for Runway 21 is only partially encompassed by the airport property line and requires an aviation easement or acquisition of approximately 9 acres of the RPZ. The Town of Taylor should also consider acquiring the property on the west side of Runway 3/21 out to the Building Restriction Line (BRL) of 500 feet left of runway centerline (approximately 22 additional acres.

COMPATIBILITY WITH STATE/REGIONAL PLANS

The master plan for the Taylor Municipal Airport should conform to all additional state and regional transportation plans. There is not a current ADOT Highway Plan for the area. According to the ADOT Transportation Planning Division, Taylor is included in the White Mountains Study Area of the Regional Transportation Profile. The White Mountains Study Area is scheduled to be studied in FY 2007.

INDUSTRIAL PARK

A mixed use 150 acre Industrial Park is currently being planned immediately adjacent to Airport Road. The Industrial Park will contain a mix of retail, technical and commercial sites with access to Airport Road. There are also some parcels listed as transitional (flexible) land use that should be coordinated with the airport to ensure compatibility with the airport. According to the draft Industrial Park Plan, the relocated airport access road will bisect the Industrial Park.

ZONING

Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the FAR Part 77 Airspace Surfaces (described in the following section). The FAA therefore recommends that all Airport Sponsors implement height restrictions in the vicinity of the airport to protect these Part 77 Surfaces. A draft height restriction zoning ordinance will be prepared as part of this Master Plan project.

COMPATIBLE LAND USE

In addition to ensuring that obstructions to Part 77 Surfaces are avoided or appropriately marked and lighted, it is recommended that the Airport Sponsor make reasonable efforts to prevent incompatible land uses from the immediate area of the airport. For example, the FAA states in FAA Advisory Circular 150/5200-33A, *Hazardous Wildlife Attractant On or Near Airports* that landfills and/or transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and waste water treatment plants should also be located this same distance from any point on the runway. Development proposals should also be reviewed to ensure compatibility in the vicinity of the airport. A draft compatible land use zoning ordinance will be prepared as part of this Master Plan project.

There are currently no on-airport incompatible land uses. There is a mobile home residence adjacent to the terminal building, however, the home owner is contracted by the Town of Taylor to serve as the night and weekend caretaker when the airport is not attended by the Airport Manager.

STATE OF ARIZONA LAND USE PLANNING

Arizona State Statues 28-8485 and 28-8486 require that airport sponsors develop Airport Influence Area (AIA) maps and airport disclosure maps. These documents will be prepared as part of the Airport Layout Plan portion of this study and will be sent to the Arizona Real Estate Department. Airport minimum standards and rules and regulations will also be prepared for the Town of Taylor as part of the Airport Operations Manual.

AIRPORT MANAGEMENT STRUCTURE

The Taylor Municipal Airport is the responsibility of the Taylor Town Manager who reports to the Taylor Town Council. Daily operation and management of the airport is delegated by the Town Manager to the Airport Manger. This management structure is considered adequate for the safe and efficient operation of the Taylor Municipal Airport.

In order to aid the Taylor Municipal Airport in the daily operation of the airport, an Airport Operations Manual will be prepared and include minimum standards, rules and regulations, statements of rates and charges, standard lease agreements, an emergency plan with a crash/rescue grid map, airport self inspection procedures, and an airport security plan. The Town of Taylor also participates in the Aeronautics Division's Pavement Management Plan program. There is currently no runway incursion program; nor is one recommended due to the single runway configuration of the airport.

SUMMARY OF FACILITY REQUIREMENTS

In summary, the facility requirements for the Taylor Municipal Airport are based on the types and volume of aircraft expected to use the airport in the short and long-term timeframes. These facilities will enable the airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in Table 3-7.

TABLE 3-7 SUMMARY OF AIRPORT FACILITY REQUIREMENTS

Facility		Short-Term (0-5 years)	Long-Term (6-20 years)
Runway			
	Length (feet)	7,203’	7,203’
	Width (feet)	75’	75’
	Strength (pounds)	12,500 (SWG)	30,000 (SWG), 45,000 (DWG)
Taxiways			
	Parallel	Yes	Yes
	Bypass Taxiways	Yes	Yes
	Width (feet)	35	35
	Strength (pounds)	12,500 (SWG)	30,000 (SWG), 45,000 (DWG)
Apron			
	Tie Downs	13	20*
	Area	5,000 SY	5,000 SY
Fencing			
	Around terminal area	Chain link	Chain link, controlled access
NAVAID			
	Approaches	NPI	NPI – WAAS
Lighting & Visual Aids			
	Runway Edge	MIRL	MIRL
	Taxiway/Apron Edge	Reflectors	MITL
	Threshold Lights	Yes	Yes
	REILs	Yes	Yes
	Approach Slope Indicator	PAPI-2	PAPI-2
	Segmented Circle/Wind Cone	Yes	Yes
	Rotating Beacon	Yes	Yes
Access & Parking			
	Automobile	8	10
Hangar Facilities			
	Small Box or T-Hangars	10	13
	Conventional-Small	0	2
	Conventional-Medium/Large	1	2
Fuel			
	100 LL (gallons)	5,000	5,000
	Jet-A (gallons)	5,000 or Truck	5,000 or Truck
	Fuel Service	24-hours AvGas Jet A as Rqd	24-hours AvGas Jet A as Rqd
Other			
	AWOS	Yes	Yes
	Unicom	Automated	Automated
	Land	7 acres for RPZ	21 Acres for BRL

**As required based on demand*

Federal Aviation Regulation (FAR) Part 77 Airspace Surfaces

Federal Aviation Regulations (FAR) Part 77 establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in Figure 3-5. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in FAR Part 77 are applied to each runway at both existing and new airports on the basis of the type of approach procedure available or planned for that runway and the specific FAR Part 77 runway category criteria. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight and less. A non-precision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight and less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority. A non-precision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure..

As described previously, the Taylor Municipal Airport currently has a non-precision instrument approach to Runway 21 and a visual approach to Runway 3. These are considered “utility” category approaches as there are currently less than 500 annual operations by aircraft over 12,500 pounds. The FAR Part 77 Airspace Surfaces for these classifications are described in the following paragraphs. While it is desirable to eliminate penetrations of FAR Part 77 airspace surfaces, in some cases, penetrations (also known as obstructions) may be mitigated with appropriate marking and/or lighting. The anticipated future LNAV/VNAV approach will result in a non-precision, greater than utility approach.

Primary Surface

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000-feet depending on the type of approach and approach visibility minimums.

Approach Surface

The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface is applied to each end of the runway based upon the type of approach available or planned for that runway, either 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the FAR Part 77 runway classification criteria.

Transitional Surface

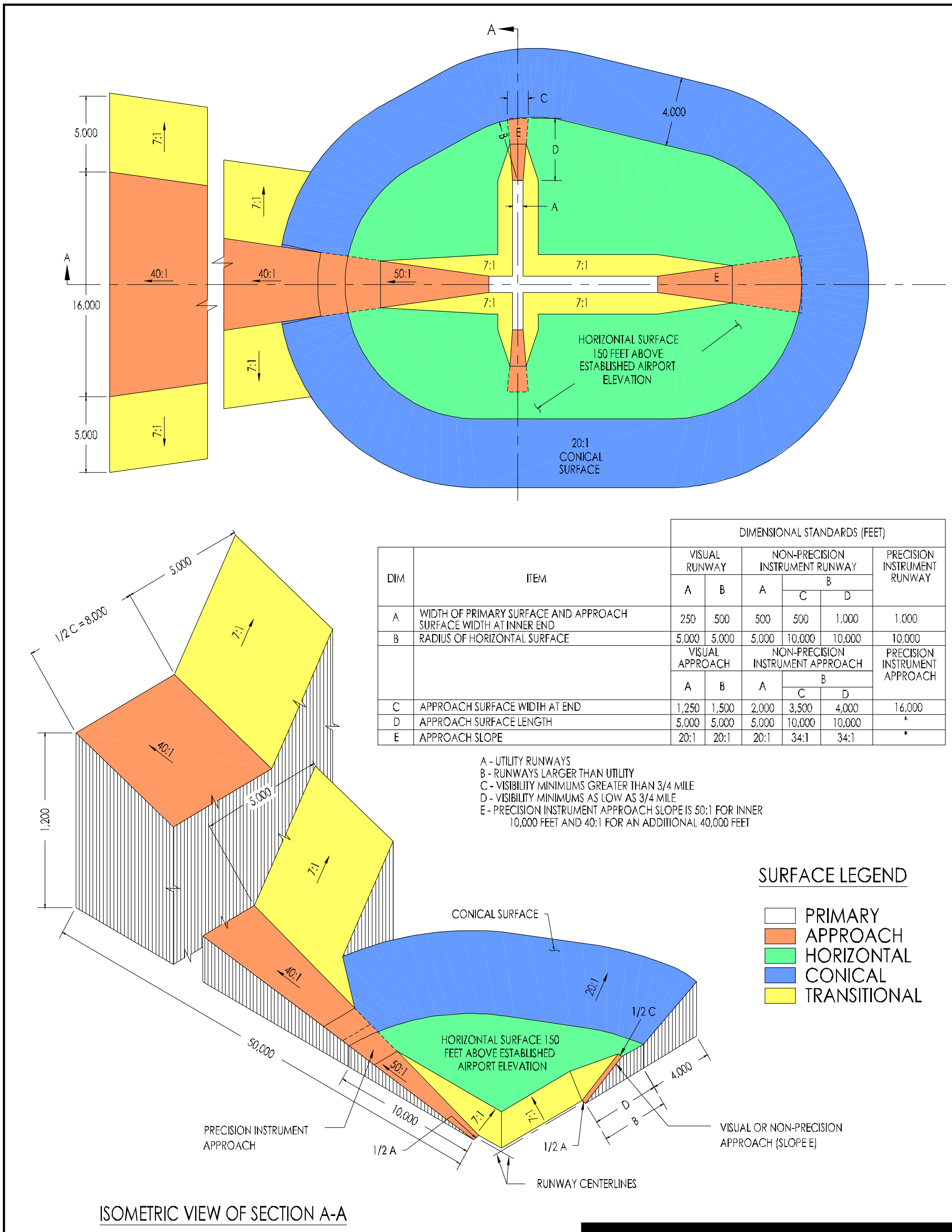
The Transitional Surfaces extend outward and upward at right angles to the runway centerlines from the sides of the Primary and Approach Surfaces at a slope of 7:1 and end at the Horizontal Surface.

Horizontal Surface

The Horizontal Surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in FAR Part 77, the Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport’s useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

Conical Surface

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

FIGURE 3-5. FAR PART 77 AIRSPACE DRAWING

SUMMARY OF DESIGN STANDARDS

Table 3-8 summarizes the FAA design standards (described in Chapter 1) for the recommended airport facilities.

TABLE 3-8 SUMMARY OF DIMENSIONAL CRITERIA

Design Criteria	Existing	Future
Airport Reference Code	B-II	B-II
Approach Type	NPI, Utility 1-mile visibility minimums	NPI > Utility 1–mile visibility minimums
FAA Airport Design Standards (AC 150/5300-13, Change 7)		
Runway centerline to parallel taxiway centerline	240'	240'
Runway centerline to edge of aircraft parking apron	250'	250'
Runway width	75'	75'
Runway shoulder width	10'	10'
Runway Safety Area width	150'	150'
Runway Safety Area length beyond runway end	300'	300'
Runway Object Free Area width	500'	500'
Runway Object Free Area length beyond runway end	300'	300'
Runway Obstacle Free Zone width	400'	400'
Runway Obstacle Free Zone length beyond runway end	200'	200'
Runway Protection Zone	500'x700'x1,000'	500'x700'x1,000'
Taxiway width	35'	35'
Taxiway Safety Area width	79'	79'
Taxiway Object Free Area width	131'	131'
Taxilane Object Free Area width	115'	115'
Runway centerline to aircraft hold lines	200'	200'
Airspace Surfaces (Part 77)		
Primary Surface width	500'	500'
Primary Surface length beyond runway ends	200’	200'
Approach Surface dimensions	500'x2,000'x5,000'	500'x3,500'x10,000'
Approach Surface slope	20:1	34:1
Transitional Surface slope	7:1	7:1
Horizontal Surface radius from runway	5,000'	10,000'
Conical Surface width	4,000'	4,000'

Source: FAA AC 150/5300-13, Airport Design; FAR Part 77, Objects Affecting Navigable Airspace